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CHANGES IN THE CLASSIFICATION OF HELICES DURING A QUARTER OF A CENTURY.

When Dr. H. A. Pilsbry published his "Guide to the Study of Helices"[1] he broke new ground in several directions, and with his masterly grasp of anatomical and systematic details revolutionized the system of classification which until then had obtained. Numerous species, subgenera, and sections placed in *Helix* by various authors were transferred to other groups, and several new genera and subgenera created by him for the reception of many other forms. The genus *Helix* was reduced to some 300 species, while the other genera totalled over 3,700 species. The number of species of all Helicid genera now known exceeds six thousand. Several previous attempts had been made, notably by Albers, von Martens, Pfeiffer, and Clessin, and, for the Palæarctic forms, by Westerlund. The absence of anatomical data in many cases operated, however, against a rational grouping of the many genera and subgenera proposed by various authors.

That the whole of this new classification should be accepted without dissent by all students of Mollusca was not to be expected, since in several cases anatomical data were still wanting, and many genera and species were only tentatively allotted a place in the system. Dr. Pilsbry himself has since made a number of corrections in the light of subsequent anatomical investigations, while many other authors have made contributions of a similar nature. Several genera have been removed to other families, many others, again, have been incorporated, among these two large ones — *Strophocheilus* and *Amphidromus*—and a great number of new genera and subgenera have been created. I now propose to enumerate *seriatim* all these additions to our knowledge of this popular group of mollusca.

Lieut.-Col. Godwin-Austen in 1898[2] established *Philalanka* as a subgenus of *Entodonta*, but in 1907[3] he placed it as a subgenus under *Thysanota*, Alb., at the same time proposing the subfamily Thysanotinæ of the family Entodontidæ. *Thysanota* had been classed as a section of *Eulota* by Pilsbry. The genus numbers twenty-one species.

In 1914[4] I established the genus *Glyptaulax* for the reception of *Helix artificiosa*, Bens., placed in *Punctum* by Tyron, and under

[1] Man. Conch., ser. II, vol. ix, Nov., 1983–Feb., 1895.
[2] Proc. Malac. Soc., iii, p. 11.
[3] Land and Freshw. Moll. India, ii, p. 190.
[4] Fauna Brit. India Moll., ii, p. 14.

Nanina by Nevill. It precedes *Thysanota*. Godwin-Austen also placed the genus *Sykesia*[1] (*Ruthvenia*[2])—proposed by me in 1897,[3] under the preoccupied name of *Austenia*, as a section of *Plectopylis*—in the subfamily Thysanotinæ.

An addition to the family of Entodontidæ was made by Pilsbry by the creation of the genus *Radiodiscus*,[4] containing five species of *Pyramidula*-like snails from Patagonia, previously ranged under *Stephanoda*, Alb.

The genus *Sphyradium*, Charp., originally proposed as a subgenus of *Pupa*, was referred to Entodontidæ near *Punctum* by Sterki,[5] but Pilsbry transferred it back to Pupillidæ.[6]

Pterodiscus, Pils., a section of *Entodonta* comprising four small Pacific Island shells, was removed by Pilsbry to Achatinellidæ.[7]

In an exhaustive anatomical paper Mr. H. Watson proves[8] that *Pyramidula rupestris*, Drap., belongs to the Pupillidæ. It does not, however, follow that all the numerous species that have been comprised under *Pyramidula* should share the same fate. In the same paper Mr. Watson refers *Pyramidula balmei*, P. & M., also to Pupillidæ. With this species for type, a new subgenus—*Pleurodiscus*—was proposed in 1919 by Herr W. Wenz.[9]

Pupisoma, Stol., doubtfully placed as a subgenus of *Pyramidula* in his "Guide", has also been transferred by Pilsbry to Pupillidæ.[10]

Wollaston proposed a section *Julus* for his *Helix garrachicœnsis*, which was placed by Pilsbry as a section under *Pyramidula*. He drew attention to the fact that *Julus* was preoccupied, but did not give a new name. I substituted the name *Kerœa*.[11]

Ashmunella was created by Cockerell & Pilsbry[12] for some North American Helices previously ranged in *Polygyra*. It now numbers twenty species.

Helix reyrei, Souv., was placed in the genus *Polygyratia* by Pilsbry, but Kobelt in 1905,[13] referred it to the family of Streptaxidæ, genus *Systrophia*, section *Entodina*, Anc. Von Ihering in 1912[14] removed another member of the group, *P. janeirensis*, Pfr., to the same section, and suggested that *P. cheilostropha*, Orb., and others might have to

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[1] Science Gossip, N.S., iii, p. 332.
[2] Proc. Malac. Soc., ix, 1911, p. 271.
[3] Science Gossip, N.S., tom. cit., p. 300.
[4] Proc. Acad. Nat. Sci. Philad., lviii, 1906, p. 154.
[5] Nautilus, x, 1896, p. 75.
[6] Ib., xxvi, 1912, p. 60.
[7] Proc. Acad. Nat. Sci. Philad., lvii, 1905, p. 572; Man. Conch., ser. II, vol. xxi, 1911, pp. 118, 120; vol. xxiii, 1914, p. 16.
[8] Proc. Malac. Soc., xiv, 1920, p. 6, et seqq.
[9] Nachr. Bl. D. Malak. Ges., 1919, p. 78.
[10] Man. Conch., ser. II, vol. xxvi, 1921, p. 19.
[11] Proc. Malac. Soc., ix, 1911, p. 271.
[12] Nautilus, xii, 1899, p. 107; Proc. Acad. Nat. Sci. Philad., 1899, p. 188.
[13] Conch. Cab. Agnatha, ii, 1905, p. 86.
[14] Journ. Acad. Nat. Sci. Philad., ser. II, vol. xv, 1912, p. 488.

follow suit. In the same article Von Ihering established the family Pleurodontidæ for the reception of *Solaropsis*, Beck, *Chlorites*, Beck, and *Pleurodonta*, Fischer, the first included by Pilsbry in Protogona, the last two in Epiphallogona (Camæninæ).

Moellendorffia, Anc., included under *Helicodonta* as a subgenus by Pilsbry, was subsequently raised to generic rank by him,[1] with two subgenera added: *Moellendorffiella*, Pils., and *Trihelix*, Anc. These with *Traumatophora*, Anc., and *Stegodera*, Mart.—formerly regarded by him as subgenera of *Plectopylis*—were now considered to have more affinity with *Chloritis*.

Corasia bourdilloni, Theob.—placed in *Nanina* by Nevill, in *Cochlostyla* by Pilsbry—has been made the type of a new genus, *Apatetes*,[2] by me, coming before *Ganesella*.

The genus *Chloritis* has received many additions during this period, and it became necessary still further to subdivide it. In 1906 I proposed a new section, *Eustomopsis*,[3] and included the genus *Albersia*, H. Ad., as another section at the end of the genus. My list of species at the time reached the total of 204, to which eleven more were added in 1907.[4] Ehrmann in 1911 [5] proposed the genus *Parachloritis*, taking as type *Eulota telitecta*, Mlldff., with a new species added, *P. sericata*. Godwin-Austen created another genus, *Burmochloritis*, in 1920,[6] for the reception of a new species, *B. kentungensis*, which he had dissected. This will probably class as a subgenus.

The genus *Strophocheilus*, Spix., previously included in *Bulimus*, was shown to belong to Acavidæ by Pilsbry.[7] It comprises the subgenera *Borus*, Alb., and *Dryptus*, Alb., totalling some forty-six species. The genus *Gonyostomus* [melior *Goniostomus*], Beck, with five species, follows likewise.

Plectopylis and *Corilla*, located with some doubt between Acavinæ and Sagdinæ by Pilsbry, I have placed in a subfamily, Corillinæ,[8] next to Acavinæ.

Enteroplax, proposed by me as a section of *Plectopylis* in 1899 [9] for three small Philippine species, has been merged into the genus *Strobilops* by Pilsbry,[10] who substituted the latter name [11] for *Strobila*, Morse, 1864 (preoccupied), when he stated it was of doubtful position, but subsequently [12] referred it to Pupidæ (= Pupillidæ),

[1] Nautilus, xix, 1905, p. 63.
[2] Fauna Brit. India Moll., ii, 1914, p. 193.
[3] Proc. Malac. Soc., vii, p. 112.
[4] Tom. cit., p. 228.
[5] Sitz-Ber. Naturf. Ges. Leipzig., xxxviii, pp. 45, 53.
[6] Rec. Ind. Mus., xix, p. 9.
[7] Man. Conch., ser. II, vol. xiv, 1902, Introd., p. iv.
[8] Fauna Brit. India Moll., ii, 1914, p. 53.
[9] Science Gossip, N.S., vi, 1899, p. 149.
[10] Nautilus, xxii, 1908, p. 79.
[11] Proc. Acad. Nat. Sci. Philad., 1892, p. 403.
[12] Nautilus, xi, 1898, p. 117.

enumerating four species. Ten years later he found the species to occur in Korea and Japan, when he also included one of Heude's species and the three Philippine species forementioned. Wenz [1] retained *Enteroplax* as a section, and gave a list with full bibliography of eleven recent and sixteen fossil species.

Amphidromus, established by Albers [2] as a section of *Bulimus*, has been incorporated with Helices by Pilsbry,[3] who from anatomical data supplied by Semper, Wiegmann, and Jacobi came to the conclusion that these South-Eastern Asiatic Bulimoid shells belonged to his group, Epiphallogona (Camæninæ), being intimately related to *Ganesella* and *Papuina*. He enumerated some 163 species *Pseudopartula*, Pfr., with three species, was added as a subgenus,[4] but was subsequently [5] transferred by him to Zonitidæ.

Draparnaudia, Montr., consisting of five species, ranged under Helicidæ by Clessin, but not included by Pilsbry in his "Guide", was subsequently placed next to *Amphidromus* by him.[6]

Dendrotrochus was established as a section of *Papuina* by Pilsbry. It contains twelve species of Pacific Island mollusca. Hedley in 1895 [7] considered it to be allied to *Trochomorpha*, while Leschke [8] placed it at the end of the Naninidæ, before *Trochomorpha*.

Ganesella trochomorpha, Mlldff., was classed as a member of the operculate genus *Omphalotropis* by Möllendorff [9] in 1895.

Buliminopsis, proposed by Heude as a genus for the reception of two of his species, was placed as subgenus under *Ganesella* by Pilsbry, who included six others. Some of the species had formerly been referred by Möllendorff to *Satsuma*, others to *Bulimus* by Ancey. Möllendorff subsequently described many other species, ultimately bringing up the total to 30, and raising the group to generic rank [10] with five sections. F. Wiegmann examined some of the species anatomically [11] and found the genus essentially to be of the *Eulota* type. Gredler added another section, *Secusana*.[12]

Trochomorphoides, introduced by Nevill for *Helix acris*, Bens., was reduced to a synonym of *Ganesella*, and again made a subgenus of the latter by Bavay and Dautzenberg.[13]

Coniglobus was established by Pilsbry [14] as a subgenus of *Eulota*

[1] Nachr.-Bl. D. Malak. Ges., 1916, p. 178.
[2] Die Heliceen, 1850, p. 138.
[3] Man. Conch., ser. II, vol. xiii, 1900, p. 127.
[4] Man. Conch., ser. II, vol. xiv, 1902, p. 1; Introd., p. iii.
[5] Nautilus, xx, 1906, p. 47.
[6] Man. Conch., ser. II, vol. xiv, 1902, p. 12; Introd., p. iii.
[7] Rec. Austr. Mus., ii, p. 90.
[8] Jahrb. Wiss. Anst. Hamb., xxix, 1912, p. 95.
[9] Nachr.-Bl. D. Malak. Ges., 1895, p. 148.
[10] Ann. Mus. Zool. St. Petersb., iv, 1899, p. 133.
[11] Ib., v, 1900, p. 145.
[12] Gymn. Progr. Bozen., 1900, p. 3.
[13] Journ. de Conchyl., lvii, 1909, p. 199.
[14] Proc. Acad. Nat. Sci. Philad., 1905, p. 735.

for three species from Formosa and Japan with *Ganesella sphæroconus*, Pfr., as type.

Two more Bulimoid forms—*B. siamensis*, Redf., and *B. rhombostomus*, Pfr.—were added as a subgenus to *Satsuma* by Ancey,[1] i.e. *Giardia*.

Psadara, Miller, given by Pilsbry as a synonym for *Solaropsis*, is stated by Von Ihering [2] to differ in its anatomy, and he quotes twenty-one species under it.

The genus *Dorcasia*, Gray, was split up into two genera by Pilsbry[3]: first, *Dorcasia*, with *H. alexandri*, Gray, as type, and four other species; second, *Trigonephrus*, with *H. globulus*, Mull., as type, and six other species. Melville and Ponsonby added to *Dorcasia* a subgenus, *Tulbaghina*,[4] with two species, while Connolly [5] raised the latter to specific rank.

Oxychona, Morch, with twelve species, was classified by Pilsbry in Belogona Euadenia (Helicinæ), next to *Polymita*; *Leptarionta*, Crosse & Fischer, was regarded by him as a synonym. Subsequently he split up the group,[6] removing *Oxychona*, type *H. bifasciata*, Burr, and three other Brazilian species to Bulimulidæ, and restoring *Leptarionta* to independent status, with the remaining eight Mexican and Central American species, to remain in Belogona Euadenia (Helicinæ).

A new genus of slug-like, dart-bearing Helicidæ was announced by Pilsbry in 1900,[7] under the name of *Metostracon*, with one species, *M. mima*, which he proposed to place near *Epiphragmophora* and *Cepolis*, where at the same time he classed the genus *Xanthonyx*, created by Crosse & Fischer [8] for the reception of *Simpulopsis cordovanus*, Pfr., and *S. salleanus*, Pfr.

Oreohelix was proposed in a short notice by Pilsbry [9] for the group of *Helix strigosa*, Gld., previously classed in the subgenus *Patula* of *Pyramidula*. The following year [10] he properly defined the genus and gave anatomical details, placing it near *Epiphragmophora*, and creating a new subgenus—*Radiocentrum*. Eleven years after [11] he gave still further anatomical data with a list of twenty-four species and numerous subspecies and varieties.

Another new genus—*Sonorella*—with similar affinities, was proposed by him,[12] based on *Epiphragmophora hachitana*, Dall,

[1] Bull. Sci. Fr. Belg., xl, 1906, p. 195.
[2] Rev. Mus. Paul., iv, 1900, p. 539.
[3] Proc. Malac. Soc., vi, 1905, p. 286.
[4] Ann. Mag. Nat. Hist., ser. VII, vol. i, 1898, p. 28.
[5] Ann. So. Afr. Mus., xiii, 1915, p. 173.
[6] Nautilus, xi, 1897, p. 87.
[7] Proc. Malac. Soc., iv, 1900, p. 24.
[8] Journ. de Conchyl., 1867, p. 223.
[9] Nautilus, xvii, 1904, p. 131.
[10] Proc. Acad. Nat. Sci. Philad., 1905, p. 268.
[11] Ib., 1916, p. 340.
[12] Ib., 1900, p. 556.

with four other species. This genus now numbers some forty-nine species.

Micrarionta, Anc., considered as a subgenus of *Epiphragmophora* in his " Guide ", was raised to generic rank [1] and divided into three sections : typical *Micrarionta*, *Eremarionta*, and *Xerarionta*. The genus included some species previously referred to *Sonorella*, and now numbers twenty-six species.

In 1896 Mr. H. Fulton proposed a new subgenus, *Xenothauma* [2] for *Helix baroni*, Fulton. Kobelt [3] placed this species in the genus *Bostryx*, while still considering it a *Helix*, at the same time referring to its apparent affinity to *Helix reentsi*, a species described by Philippi in 1855,[4] which shared a similar fate when it was transferred by Pilsbry [5] to *Bostryx*, who then reduced the latter to subgeneric rank under *Bulimulus*, creating a new section—*Platybostryx*—for the reception of *H. reentsi*, and substituted the specific designation *eremothauma*, on account of the previously described *Bulimus reentsi*.[6]

Cathaica, originally proposed as a group of Helices by Möllendorff, was adopted by Pilsbry as a section of *Eulota*, but Andreae in 1900 raised it to generic rank [7] and split it into five subgenera, four of these new (*Eucathaica*, *Pliocathaica*, *Xerocathaica*, *Campylocathaica*), and *Pseudiberus*, Anc. In 1919 I introduced another subgenus, *Trichocathaica*,[8] taking *C. lyonsœ*, a new species described at the same time, as type. *Semibuliminus*, proposed as a section of *Buliminopsis* by Möllendorff [9] for *B. beresowskii*, and in which, subsequently, he included [10] a shell described by Sturany as ? *Satsuma kutupaënsis*,[11] I consider more probably as pertaining to *Cathaica*, and therefore suggest its transference, as a seventh subgenus of the latter. *Lœocathaica* was introduced by Möllendorff [12] as a distinct genus of sinistral forms of *Cathaica* with *Helix christinœ*, H. Ad., as type. Fourteen species are now classed under it.

Acusta, introduced as a section of *Nanina* by Von Martens [13] for three species, with *Helix ravida* as type, was treated as a synonym for *Eulota* by Pilsbry, but Möllendorff [14] revived it as a section of

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[1] Ib., 1913, p. 380.
[2] Ann. Mag. Nat. Hist., ser. VI, vol. xviii, p. 102.
[3] Conch. Cab. Heliceen, iv, 1897, p. 843.
[4] Ann. Univ. Chile, 1855, p. 213.
[5] Man. Conch., ser. II, vol. x, 1896, p. 155.
[6] Zeits. Malak., viii, 1851, p. 30.
[7] Mitth. Roemer Mus., No. 12, p. 2.
[8] Proc. Malac. Soc., xiii, p. 119.
[9] Ann. Mus. Zool. St. Petersb., iv, 1899, p. 133.
[10] Ib., 1902, p. 307.
[11] Denkschr. Math. Naturw. Cl. K. Akad. Wiss., 1900, p. 12.
[12] Ann. Mus. Zool. St. Petersb., iv, 1899, p. 86.
[13] Die Heliceen, 1860, p. 56.
[14] Ann. Mus. Zool. St. Petersb., 1899, p. 73.

Eulota; at the same time he proposed a new section *Eulotella*,[1] which now numbers some twenty-five species.

Some further subgenera of *Eulota* remain to be dealt with. *Neseulota*, proposed by Ehrmann [2] with three species, the type being *E. hemisphærica*, Mlldff.; *Landouria* [3] with five species, having *H. huttoni*, Pfr., for type; and *Mikiria* [4] by Godwin-Austen; *Cœlorus* [5] by Pilsbry for *E. cavicollis*, Pils., to which two other species were added subsequently; *Dolicheulota* [6] created by Pilsbry for the reception of two Bulimoid forms: *B.* (*Amphidromus*) *formosensis*, Ad., and *B. swinhoei*, Pfr.

In 1913 M. Germain proposed the genus *Halolimnohelix* [7] for tropical African mollusca, with a subgenus *Massaihelix*. Pilsbry in an important article on land mollusks of the Belgian Congo [8] adds many new species with anatomical details, indicating its place in the system near *Eulotella* and *Trishoplita*. At the same time he suggests that all or several of the new genera introduced by Preston as Zonitoid [9] may be synonymous with or of subordinate rank to Germain's genus. He also proposes two additional new genera—*Vicariihelix* and *Haplohelix*—of similar affinities, each with one species.

A new genus—*Stilpnodiscus*—was created by Möllendorff [10] for the reception of three new Western China species with *S. vernicina* as type. Its place in the system appears to be between *Plectotropis* and *Ægista*. Sturany in the following year added a fourth species,[11] *S. euphyes*.

Trishoplita, a genus confined to Japan, was introduced by Jacobi [12] for *T. pallens*, Ehrm., and *Helix goodwini*, Smith, the latter classed in *Ganesella* by Pilsbry. Many others have since been transferred from *Ganesella* and new species described. It now totals twenty-two species.

Systenostoma was created in 1909 by Bavay and Dautzenberg [13] for two small Indo-Chinese species, and placed next to *Plectotropis*. A third species was added in 1912 [14] by them, when they judged that the genus had affinity with *Hypselostoma* and *Boysidia*, a view

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[1] Tom. cit., p. 76.
[2] Sitz.-Ber. Naturf. Ges. Leipzig, xxxviii, 1911, p. 61.
[3] Rec. Ind. Mus, viii, 1918, p. 604.
[4] Tom. cit., p. 611.
[5] Proc. Acad. Nat. Sci. Philad., 1899 (Feb., 1900), p. 528.
[6] Man. Conch., ser. II, vol. xiv, 1901, p. 18; Introd., p. iii.
[7] Bull. Mus. Paris, xix, p. 351.
[8] Bull. Amer. Mus. Nat. Hist., xl, 1919, p. 36.
[9] Proc. Zool. Soc., 1914, pp. 795–803.
[10] Ann. Mus. Zool. St. Petersb., 1899, p. 65.
[11] Denkschr. k. Akad. Wiss. Wien, lxx, 1900, p. 19.
[12] Journ. Coll. Sci. Imp. Univ. Tokyo, xii, pt. i, 1898, p. 65.
[13] Journ. de Conchyl., lvii, p. 196.
[14] Ib., lx, p. 23.

which was confirmed by Pilsbry,[1] who placed it near *Aulacospira* in Pupillidæ.

Aulacospira, introduced as a genus or subgenus of the family Hygromiidæ by Möllendorff,[2] was placed next to *Hygromia* by Pilsbry in his "Guide", but subsequently [3] he transferred it to Pupillidæ.

Two subgenera to the genus *Theba* were proposed in 1914 by Hesse,[4] i.e. *Paratheba* for *Helix fruticola*, Kryn., as type and *H. rothi*, Pfr., and *Metatheba* for *H. samsunensis*, Pfr., and *T. orientalis*, Hesse, the former taken as type.

Cylindrus proposed by Fitzinger in 1833 for *Pupa obtusa*, Drap., was transferred in 1895 by Pilsbry [5] to the Helices, its place being indicated near *Helicella* and *Hygromia*.

Acanthinula of Beck, although with a very old species as type, *Helix aculeata*, Mull., was very imperfectly known from an anatomical point of view, until examination by Hesse,[6] Steenberg,[7] and Watson [8] proved its affinity to lie with Pupillidæ.

The same fate was shared by *Vallonia*, the anatomy of which was investigated by Pilsbry [9] and Watson.[8]

Soosia was proposed by Hesse [10] as a genus with *Helix diodonta*, Muhlf., for type, placed in *Helicodonta* by Pilsbry. At the same time Hesse named a subfamily Helicodontinæ for (1) his new genus, (2) *Helicodonta* s.s., (3) *Drepanostoma*, and (4) *Caracollina* (sections of Pilsbry), (5) *Œstophora*, and (6) *Mastigophallus*, the latter another new genus for the reception of one species, *Helix rangiana*, Fér. *Œstophora* had been created by him previously [11] without naming a type, but now he fixes on *Helix lusitanica*, Pfr., and adds a list of fifteen species to be included.

Aspasita, established by Westerlund as a section of *Gonostoma* [12] for three small species from S.E. Europe, was retained as a section under *Helicodonta* by Pilsbry, but Hesse [13] removes it with *Acanthinula* and *Vallonia* to Pupillidæ.

Klikia was proposed as a section of *Helicodonta* by Pilsbry in 1894 with *Helix osculum*, Thomae, a Miocene species, for type. C. R. Boettger proposed [14] a section *Apula* under *Hygromia* for

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[1] Man. Conch., ser. II, xxiv, 1917, p. 225.
[2] Ber. Senck. Naturf. Ges., 1890, p. 224.
[3] Man. Conch., ser. II, xxiv, 1917, p. 225.
[4] Mitt. Kauk. Mus. Tiflis, vi, p. 268.
[5] Ann. Mag. Nat. Hist., ser. VI, xvi, p. 155.
[6] Nachr.-Bl. D. Malak. Ges., 1915, p. 55.
[7] Vidensk. Medd. Dansk. Naturh. Foren., lxix, 1917, p. 1.
[8] Proc. Malac. Soc., xiv, 1920, p. 6.
[9] Proc. Acad. Nat. Sci. Philad., 1900, p. 564.
[10] Nachr.-Bl. D. Malak. Ges., 1918, pp. 103, 104, 109.
[11] Ib., 1907, p. 76.
[12] Fauna Pal. Binn. Conch., i, 1889, p. 18.
[13] Nachr.-Bl. D. Malak. Ges., 1918, p. 119.
[14] Ib., 1909, p. 15.

Helix devexa, Reuss, and H. *coarctata*, Klein, the former for type, but later,[1] while raising *Klikia* to generic rank, he subordinated *Apula* to the latter genus.

Brusina proposed *Vidovicia*[2] as a new genus for the group of *Helix lacticina*, Ziegl.; Soos five years later[3] suggested the name of *Hazaya* for *Helix cœrulans*, Muhlf. Now, *lacticina* being a synonym of *cœrulans*, Soos' designation becomes synonymous with Brusina's. This group of Helices was included by Pilsbry in the section *Chilostoma*, Fitz., of the genus *Helicigona*, Risso.

Further divisions of the groups of *Helix* included in *Chilostoma* by Pilsbry were made by Brusina[2] as follows: *Drobasia* for the group of *Helix banatica*, Partsch (C. R. Boettger proposed *Partschia*[4] for the same group); *Sabljaria* for the *Helix stenomphala*, Mke. group, *Cattania* for *H. trizona*, Zglr., and its allies, *Botteria* for *H. setosa*, Zglr., with five other species, and lastly *Kosicia* for *Helix intermedia*, F., and two others.

Helix vermiculata and its allies were placed by Pilsbry under his section *Otala*, Schum. A considerable amount of exception has been taken to this course by many Continental authors. *Archelix*, considered a synonym by Pilsbry, has been revived for this group by Hesse,[5] when he gave the result of his anatomical investigations and published a list of species.[6] At the same time he separated a number of species to form two subgenera: *Archelix* s.s. and *Dupotetia*, the latter with two sections: *Dupotetia* s.s. and *Deserticola*. Pallary also dealt with the genus[7] when he illustrated several species, and four years later established another section, *Tingitana*[8] for a group of species of *Archelix*, which in the immature stage are strongly carinated and in the adult state have the earlier whorls edged. He selected his *Archelix minettei* as type, and described at the same time seven other species, together with several varieties.

Hesse proposed the subfamily Murellinæ[9] for the following four genera: *Murella*, Pfr. (considered a subsection of section *Iberus* under *Helix* by Pilsbry), *Opica*, Kob.[10] (many of the species placed in subsection *Macularia* by Pilsbry), *Marmorana* (Hartm.), Kob.,[11] and *Tyrrheniberus*, Kob. & Hesse.[12] Most of the species arranged

[1] Ib., 1912. p. 131.
[2] Ib., 1904, p. 162.
[3] Ann. Mus. Nat. Hung., vii, 1909, p. 43.
[4] Nachr.-Bl. D. Malak. Ges., 1911, p. 21.
[5] Icon. N.F., xvi, 1909, p. 27.
[6] Tom. cit., 1910, p. 97.
[7] Nachr.-Bl. D. Malak. Ges., 1914, p. 8.
[8] Bull. Soc. Hist. Nat. Afr. Nord., ix, 1918, p. 145; Journ. de Conchyl., lxiv (1918), 1919, p. 51.
[9] Iconogr. N.F., xxiii, p. 230.
[10] Ib., N.F., xi, 1904, pp. 156, 198.
[11] Tom. cit., pp. 157, 199.
[12] Tom. cit., pp. 157, 199.

by Pilsbry under section *Otala* have been redistributed by Hesse and others among the following genera : *Massylæa*, Mlldff.,[1] *Iberellus*, Hesse [2] (= *Balearica*, Kob.[3]), *Eobania*, Hesse,[4] *Archelix*, Alb., and subgenus *Dupotetia*, Kob.,[5] with a section *Deserticola*,[6] *Codringtonia*, Kob.,[7] and *Isaurica*, Kob.[8] The other Palæarctic genera were placed under the subfamily Helicinæ,[9] i.e. *Euparypha*, Hartm., *Massylæa*, Mlldff., *Atlasica*, Pallary,[10] *Iberellus*, Hesse, *Allognathus*, Pils., *Iberus*, Montf., *Rossmaessleria*, Hesse,[11] *Eobania*, Hesse, *Archelix*, Alb., *Pseudotachea*, C. R. Bttgr.,[12] *Cepæa*, Held., *Macularia*, Alb., *Maurohelix*, Hesse [13] (= *Wiegmannia*, Hesse,[14] = *Gaetulia*, Kob.),[15] *Tacheocampylæa*, Pfr., *Codringtonia*, Kob., *Isaurica*, Kob., *Levantina*, Kob., with three subgenera : *Levantina* s.s., *Assyriella*, Hesse,[16] and *Gyrostomella*, Hesse [17] (= *Gyrostoma*, Hesse),[18] *Tacheopsis*, C. R. Bttgr. [19] *Caucasotachea*, C. R. Bttgr.,[20] with two subgenera : *Caucasotachea* s.s. and *Lindholmia*, Hesse [21]; *Helix*, L., with the following subgenera : *Tyrrhenaria*, Hesse,[22] *Hessea*, C. R. Bttgr.,[23] *Cryptomphalus*, M.T., *Maltzanella*, Hesse [24] (= *Maltzania*, Hesse non Bttgr.),[25] *Pseudofigulina*, Hesse [26] (= *Pelasga*, Hesse),[27] with two sections : *Pseudofigulina* s.s. and *Naegelia*, Hesse [28]; *Helicogena*, F., with four sections : *Physospira*, C. R. Bttgr.,[29] *Rhododerma*, Hesse,[30] *Pachyphallus*, Hesse,[31] and *Pomatia*, Leach. Lastly follow *Eremina*, Pfr. (= *Eremophila*, Kob.), and *Hemicycla*, Swains.

This completes my survey of the proposed changes and modifications in the classification of Helices since 1895.

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[1] Nachr.-Bl. D. Malak. Ges., 1898, p. 120.
[2] Ib., 1908, p. 131.
[3] Iconogr. N.F., xi, 1904, pp. 157, 200.
[4] Nachr.-Bl. D. Malak. Ges., 1913, p. 13.
[5] Iconogr. N.F., xvi, 1911, p. 95.
[6] Tom. cit., p. 95.
[7] Stud. Zoogeogr., ii, 1898, pp. 208, 306.
[8] Iconogr. N.F., ix, 1901, p. 36.
[9] Op. cit., xxiii, 1918, p. 233.
[10] Journ. de Conchyl., xliii, 1917, p. 135.
[11] Iconogr. N. F., xiv, 1907, p. 8 ; xxiii, 1915, p. 32.
[12] Nachr.-Bl. D. Malak. Ges., 1909, p. 10 ; ib., 1911, p. 131.
[13] Ib., 1917, p. 122.
[14] Ib., 1916, p. 124.
[15] Stud. Zoogeogr., ii, 1898, pp. 208, 357.
[16] Zool. Jahrb. Syst., xxvii, 1908, p. 319.
[17] Iconogr. N.F., xvi, 1911, p. 113.
[18] Zool. Jahrb. Syst., xxvii, 1908, p. 320.
[19] Nachr.-Bl. D. Malak. Ges., 1909, p. 10 ; ib., 1911, p. 130.
[20] Op. cit., 1909, p. 10 ; 1911, p. 130.
[21] Nachr.-Bl. D. Malak. Ges., 1918, p. 38.
[22] Tom. cit., p. 38.
[23] Ib., 1917, p. 122.
[24] Ib., 1917, p. 123.
[25] Ib., 1918, p. 38.
[26] Ib., 1918, p. 38.
[27] Ib., 1911, p. 128.
[28] Ib., 1908, p. 140.
[29] Ib., 1908, p. 139.
[30] Ib., 1914, p. 103.
[31] Tom. cit., p. 38.